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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/465,592      | 12/17/1999  | JOANNE P. CULVER     | LAZE-01000US        | 9065             |

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| EXAMINER |
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CHU, KIM KWOK

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| ART UNIT | PAPER NUMBER |
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2627

DATE MAILED: 07/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 09/465,592             | CULVER ET AL.       |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | Kim-Kwok CHU           | 2627                |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on Amendment filed on May 2, 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 10,11,13-19,22,23,32,40-46,49-51,57,58 and 60 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10,11,13-19,22,23,40-44 and 49-51 is/are allowed.
- 6) ☒ Claim(s) 32,45,46,57,58 and 60 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/17/1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**Response to Remarks**

1. Applicant's Amendment filed on May 02, 2006 has been fully considered.

(b) With respect to the allowable Claims 32, 45, 46, 57, 58 and 60, a newly found prior art of Suzuki of US Patent 5,929,438 is cited to reject the Claims.

**Claim Rejections - 35 USC § 102**

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

*A person shall be entitled to a patent unless -  
(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.*

3. Claims 32, 45, 46, 57 and 58 are rejected under 35 U.S.C. § 102(e) as being anticipated by Suzuki et al. (U.S. Patent 5,929,438).

Suzuki teaches a memory apparatus having all the elements and means as recited in claims 32, 45, 46, 57 and 58.

(a) With respect to Claim 32, a movable media 20 having a surface for placing anomalies (Fig. 19; AFM is used; column 2, lines 50-62); a moveable reading/writing mechanism (Fig. 19) comprising: a moveable platform 22 (Fig. 19); and at least one

fine tip portion 31 attached to the moveable platform 22 configured to write (cause) anomalies and read anomalies on the media surface 20 (Fig. 19); a media movement mechanism 29 attached to the moveable media 20 and configured to move the media 20 in response to media control signals (Fig. 19); a platform movement mechanism 27 attached to the platform 22 and configured to move the platform 22 in response to platform control signals (Fig. 19); wherein the at least one fine tip portion 31 comprises a device configured to cause the formation of an anomaly on the media surface (Fig. 19; tip 30 is an AFM scanning probe); wherein each fine tip portion 30 further comprises: a cantilever 21 attached to each fine tip portion 31; and an activation/pickup device 15 connected to each cantilever; wherein the activation/pickup device 15 is at least one of electrostatically and capacitively activated causing said cantilever to vibrate near a resonance frequency of the cantilever (Fig. 19; column 14, lines 52-55) and the activation/pickup mechanism 15 is configured to detect a phase change of vibrations of the cantilever 21 caused by the fine tip interacting with the media surface 20 via at least one of electrical, magnetic, and physical forces (Fig. 19; column 14; lines 42-47).

(b) With respect to Claim 45, a movable media 20 having a surface for placing anomalies thereon (Fig. 19; AFM is apply to

the media 20); a moveable reading/writing mechanism (Fig. 19), comprising: a moveable platform 22 (Fig. 19); and at least one fine tip portion 31 attached to the moveable platform 22 configured to write (cause) anomalies and read anomalies on said media surface (Fig. 19); a media movement mechanism 29 attached to the moveable media 20 and configured to move the media 20 in response to media control signals (Fig. 19); a platform movement mechanism 27 attached to the platform and configured to move the platform in response to platform control signals (Fig. 19); wherein the at least one fine tip portion 31 comprises a device (tip) configured to cause the formation of an anomaly on the media surface (Fig. 19); a z-axis mechanism 23 connected to at least one of the fine tip portions 31 and the platform 22 (Fig. 19; column 2, lines 50-62); wherein the z-axis mechanism is configured to place the at least one of the fine tip portions 31 at least one of on and near the media surface 20 (Fig. 19); wherein the z-axis drive mechanism comprises: a lever 21 connected to the fine tip portion 31 at one end (Fig. 19; cantilever 21 is connected to the tip 31); a thermal bimorph 22a (piezoelectric means), comprising a heater, and at least two materials of different expansion coefficients (Fig. 19; column 14, lines 51 and 52); wherein a current applied to the heater raises the temperature of the bimorph 22a, causing the bimorph 22a to expand or

contract and move the lever 21 and the fine tip portion 31 in a z-axis direction.

(c) With respect to Claim 46, the heater 22a is a polysilicon resistor (Figs. 19 and 20; piezo resistor 22a/402 is made of silicon layers as an integrated part of the silicon cantilever).

(d) With respect to Claim 57, it has limitations similar to those treated in the above rejection of claim 45, and is met by the reference as discussed above. Claim 57 however also recites the following limitation which is also taught by the prior art of Suzuki: nubs (31) placed between the media 20 and the platform 22 for providing a bearing (support) for movement of the platform 22 relative to the media 20 (Fig. 19).

(e) With respect to Claim 58, it has limitations similar to those treated in the above rejection of claim 45, and is met by the reference as discussed above. Claim 58 however also recites the following limitation which is also taught by the prior art of Suzuki: the media 20 comprises an amplifying media (AFM) having electrodes at ends of the media (Fig. 19; media 20 is grounded), and a control area (topology of the media) activated by the tip 31 (Fig. 19; topology of the media provides information such as servo data, recorded data etc).

**Claim Rejections - 35 USC § 103**

4. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

*(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.*

5. Claim 60 is rejected under 35 U.S.C. 103 (a) as being unpatentable over Suzuki et al. (U.S. Patent 5,929,438) in view of Koyanagi et al. (U.S. Patent 5,471,064).

Suzuki teaches a memory apparatus very similar to that of the present invention as rejected in Claim 58. However, Suzuki does not teach the media comprises a substrate having pits placed thereon, and layers of doped material and insulators covering the media.

Koyanagi teaches a media comprises a substrate having pits placed thereon, and layers of doped material and insulators 4 covering the media (Fig. 7a and 7b).

The anomalies in a sample can be considered as a form of topological shapes on a storage medium. Hence, although Suzuki does not disclose a recording medium, it would have been obvious to one of ordinary skill in the art to use Koyanagi's

storage medium as Suzuki's sample means, because the storage medium can record information in form of pits as a form topology instead of creating anomalies on the surface of the sample.

***Allowable Subject Matter***

6. Claims 10, 11, 13-19, 22, 23, 40-44 and 49-51 are allowable over prior art.

7. The following is an Examiner's statement of reasons for the indication of allowable subject matter based on the Amendment filed on May 2, 2006.

As in claim 10, the prior art of record fails to teach or fairly suggest that the electrostatic device comprises a series of prong sets, wherein, the prong sets are attached in series such that a first of the prong sets is attached at a first end to a fixed position of the apparatus, and a second end of the first prong set is attached to a first end of a second of the prong sets, and so on, until a last of the prong sets is attached at a first end to a second end of an  $n-1$  prong set, and a second end of the last ( $n$ ) prong set is attached to one of the media and the platform.

As in claim 22, the prior art of record fails to teach or fairly suggest that wherein the capacitance sensor comprises



a fixed comb having fingers protruding in an x-axis direction, a moving comb connected to the coupling having fingers protruding in an x-axis direction and interleaved among the fingers of the fixed comb.

As in claim 23, the prior art of record fails to teach or fairly suggest that a capacitive comb array comprises a fixed comb and a moving comb each having a set of fingers interleaved between the other set of fingers.

As in claims 40 and 41, the prior art of record fails to teach or fairly suggest that the z-axis drive mechanism comprises a cantilever connected to the fine tip portion at one end, and at least one set of comb fingers rotatably attached to the platform allowing movement of the cantilever and the fine tip portion in at least a z-axis direction.

As in claim 43, the prior art of record fails to teach or fairly suggest that the z-axis drive mechanism comprises a lever connected to the fine tip portion at one end; a torsion bar connected at a second end of the lever; an isolation bridge connected at one of the second end of the lever and the torsion bar; a second torsion bar connected to the isolation bridge.

As in claim 49, the prior art of record fails to teach or fairly suggest that a cantilever having the fine tip attached at a first end; a moving assembly attached to the cantilever, comprising, a torsion bar electrically isolated and attached to

the cantilever, and a force receiver attached to the cantilever and configured to apply force to the cantilever.

The features indicated above, in combination with the other elements of the claims, are not anticipated by, nor made obvious over, the prior art of record.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ried (5,856,672) is pertinent because Reid teaches a memory apparatus having an vibrating actuator.

Martin et al. (5,283,442) is pertinent because Martin teaches a memory apparatus having an vibrating actuator.

9. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Kim CHU whose telephone number is (571) 272-7585 between 9:30 am to 6:00 pm, Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch, can be reached on (57) 272-7589.


The fax number is:

(571) 273-8300 (for formal communications intended for entry. Or:

(571) 273-7585, (for informal or draft communications, please label "PROPOSED" or "DRAFT").

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished application is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>.

Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9191 (toll free).

  
THANG V. TRAN  
PRIMARY EXAMINER

Kim-Kwok CHU

*kc* 7/21/06

Examiner AU2627  
July 21, 2006

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